



(19) Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) Publication number: 0 565 492 A2

(12)

## EUROPEAN PATENT APPLICATION

(21) Application number: 93830094.4

(51) Int. Cl.<sup>5</sup>: E06B 3/46, E06B 3/26

(22) Date of filing: 10.03.93

(30) Priority: 24.03.92 IT MI920698

(43) Date of publication of application:  
13.10.93 Bulletin 93/41

(84) Designated Contracting States:  
AT BE CH DE DK ES FR GB GR IE LI LU MC NL  
PT SE

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(54) Thermal cut section member assembly for making sliding wing window and door frames.

(57) The present invention relates to a thermal-cut section member assembly, for making sliding wing window and door frames, characterized in that the assembly comprises fixed frame section members including a bottom rail and a top rail, connected by shoulder section members.

The rails are provided with a central body the two sides of which are arranged adjoining side bodies, connected to the central body by means of thermally insulating spacer rods.

Moreover, there are provided sliding wing section members, including box-like regions, for housing corresponding connecting brackets.

To the wing section members, forming the central uprights, there are connected, through the interposition of a latching section member made of a thermally insulating material, finishing section members.

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## BACKGROUND OF THE INVENTION

The present invention relates to a thermal-cut section member assembly, for making slidable wing window and door frames.

As is known, in making slidable wing window and door frames, there are encountered great difficulties for obtaining the so-called "thermal cut" that is the interruption of the metal conducting bridges between the inner surface and outer surface of the section member forming the frame.

Actually, in prior art solutions, the thermal cut baffles are so designed as to remarkably reduce the mechanical strength characteristics of the section member.

Another problem affecting the slidable wing window and door frames, is that the guide rails thereon the wings of the frame slide, are subjected to a great wear, and it is not possible to replace the sliding tracks, thereby, in the time, the wings will encounter a great friction against their proper sliding.

Another drawback is that the slidable wing window and door frames have a poor application flexibility, since they do not afford the possibility of easily applying fitting to the window or door frames

## SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing a thermal-cut section member assembly, specifically designed for slidable wing window and door frames, which is adapted to provide both the fixed frame and the wings with a very high mechanical strength.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such a section member assembly which allows to solve the problem of the wear of the guiding tracks of the slid-able wings, so as to provide a very efficient frame.

Another object of the present invention is to provide such a section member assembly the section members of which can be easily made and assembled and which can be easily made starting from commercially available elements and materials and which, moreover, is very competitive from a mere economic standpoint.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a thermal-cut section member assembly, for making slidable wing window and door frames, characterized in that said assembly comprises fixed frame section members, including a bottom rail and a top rail, connected by shoulder section members and having a central body adjoining, on its two sides, side bodies connected to said central body by means of spacer rods, made of a thermally

insulating material, there being moreover provided sliding wing section member provided with box-like regions for housing therein connecting brackets, to the wing section members forming the central uprights there being coupled finishing section members, connected through the interposition of a latching section member made of a thermally insulating material.

Further characteristics and advantages of the present invention will become more apparent herein-after from the following detailed disclosure of a thermal-cut section member assembly, for making sliding wing window and door frames, which is illustrated, by way of an indicative, but not limitative example,in the figures of the accompanying drawings, where:

- 5 Figure 1 illustrates a bottom rail section member with inter-exchangeable guide inserts;
- 10 Figure 2 illustrates a bottom rail section member;
- 15 Figure 3 illustrates a fixed frame top rail section member;
- 20 Figure 4 illustrates a fixed frame shoulder section member;
- 25 Figure 5 illustrates a movable wing section member;
- 30 Figure 6 illustrates a movable wing section member, with an increased thermal cut portion;
- 35 Figure 7 illustrates a finishing section member for finishing intermediate uprights of movable wings;
- 40 Figure 8 illustrates a fixed frame vertical section member which can be coupled to section mem-bers for making movable wings of the swinging type;
- 45 Figure 9 illustrates a horizontal section member for a fixed frame, which can be coupled to section members for making movable wings of the swing-ing type;
- 50 Figure 10 schematically illustrates a window frame having two sliding wings;
- 55 Figure 11 illustrates a cross-sectional view, substantially taken along the line XI-XI of figure 10;
- Figure 12 illustrates another cross-sectional view, substantially taken along the line XII-XII of figure 10;
- Figure 13 illustrates a further cross-sectional view, substantially taken along the line XIII-XIII of figure 10;
- Figure 14 illustrates yet another cross-sectional view, substantially taken along the line XIV-XIV of figure 14;
- Figure 15 schematically illustrates a sliding wing window frame, having an openable top with a swinging movable wing;
- Figure 16 illustrates a cross-sectional view sub-stantially taken along the line XV-XV of figure 15;
- Figure 17 illustrates another cross-sectional view, substantially taken along the line XVI-XVI of figure 15.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

With specific reference to the number references of the above mentioned figures, and, more specifically, to figures 1 and 2, fixed frame section members are herein illustrated, which comprise bottom rails, respectively indicated at the reference numbers 1 and 2, which are provided with a central body 3 and 3A which is connected to an inner side body 4 and 4A and to an outer side body 5, by means of rods 6 engaged in corresponding seats and made of a thermally insulating material, of the polyamide type.

Moreover, at the bottom side, there are provided latching seats, indicated at the reference numbers 7 and 8, for the connection to the fixed structure.

The difference between the section member 1 and the section member 2 is that the section member 1 is provided, at the central body 3 and inner side body 4, with inter-exchangeable section members 9, forming the guide rail for the sliding wings and which can be replaced as they are worn out.

This is an important feature of the present invention, since it allows the window or door frames to be always held in perfect operation conditions, owing to the possibility of compensating, in a very simple manner, the wear of the parts subjected to a continuous sliding movement.

Figure 3 illustrates a fixed frame top rail section member, indicated at the reference number 10, which is provided with a central body 11, to which there are connected, by means of spacer rods, also indicated at the reference number 6, an outer side body 12 and an inner side body 13.

On the side bodies there are provided lugs 14 which, in cooperation with lugs 15 of the central body, will provide affixing regions for the connection to the fixed structure.

Advantageously, the elements are provided with box-like regions, with suitable housing seats in order to allow, by means of fixing screw, the connection with the shoulder section members, indicated at 20, which are provided with an inner box-like elongated body 21, connected to an outer body 22, through the rods 6.

On a face of the shoulder section members 20 there are provided seats 23, for coupling the spacer elements and position adjusting elements to the fixed structure, whereas on the other side there are provided fins 25, which extend perpendicularly with respect to the inner face and which operate as an abutment element for the sliding wings.

The sliding wings, as is shown in Figures 5 and 6, comprise a sliding wing section member 30 and a sliding wing section member 31 which are generally similar to one another, since they are provided with a box-like central body 32 including a seat 33 for engaging therein a glass-restraining section member, indicated at 34; from the central body there extending an inner leg 35 delimiting a box-like seat 36.

The outer leg, indicated at 37, is connected to the polyamide spacer rods 6 and, in the case of the section member 30, there are provided box-like seats 38 for engaging therein connecting brackets, whereas, with respect to the section member 31, the length of the spacer rods 6 is larger, and the outer leg 37 does not comprise any box-like seats.

The box-like seats allow to engage therein brackets from the two sides, for connecting and fixing the movable wing frame, which, in this manner, will have a great mechanical strength and will be properly connected.

At the central uprights of the movable wings, there is provided a finishing section member, indicated at the reference number 40 and specifically shown in figure 7, which has a substantially L-shape, with a leg 40a arranged in engagement between the outer leg and inner leg of the section members 30 and 31 and being provided with a locking tooth member 41.

The other leg or arm 40b, which is practically interposed between two movable wing frames, is provided with a hollow 42, in which there is engaged a locking or latching section member 45, made of a polyamide material and shown in figure 11, adapted to provide a thermal cut or interruption between the section member and movable wing and being moreover provided with an end portion 46 covering the free end portion of the arm 40b, where is performed the connection.

Near the attachment region of the covering leg 46, there is provided a seat 47, in which there is engaged a seal 48 which is practically compressed, in a closure condition, by the covering section member 46 of the facing wing so as to provide a double sealing chamber, consisting of the two gaskets or seals 48 delimiting an air inner chamber 49, which will provide a perfect sealing with respect to the environment air.

Moreover, the front engagement between the end portion of the section member 46 and seals 48 will practically provide a resilient abutment or stop action, during the sliding movement, as the movable wings are coupled.

Figure 8 illustrates a fixed frame vertical section member, for providing a frame top portion, indicated generally at the reference number 50, which section member must be used as to a sliding wing window frame one must connect a fixed frame top or, possibly, a swinging openable frame top.

This section member 50 is provided with a box-like body 51 comprising engagement seats 52 for the connection to the fixed structure and, on the other side thereof, including an inner abutment leg 53, for the abutment against the swinging wing or against a fixed glass plate of the frame top.

Moreover, to the body 51 there is connected an inner body, indicated at 55, which is in turn coupled

to the spacer rods.

Figure 9 illustrates a fixed frame horizontal section member for making a frame top, said section member being indicated at the reference number 60 and including a sloping central body 61, provided with an inner abutment leg 62 and coupling seats 63 on the other face thereof, allowing to perform a connection, as is shown in figure 17, with the top guide rail by means of fixing screws and by a covering section member 66 acting as a closure on the end faces.

Figure 17 specifically shows the provision of guide pads 70, made of a rigid plastic material, arranged on the sliding wing section members, and suitable to operate as guide elements against the projections 17 formed on the section member 10 which in turn practically operate as a holding and containment element for the sliding wing frame during the translation movement of the sliding wing.

Moreover, as is shown in figure 13, there is provided a closure lock, of the "raise and slide" type, indicated at the reference number 80, provided with an operating handle 81, including a cam engaging with locking means 84 connected to the shoulder section member 20 which, as already disclosed, is associated with the fixed structure by means of adjusting spacer elements.

From the above disclosure it should be apparent that the invention fully achieves the intended aim and objects.

In particular, the fact is to be pointed out that a section member assembly has been provided which allows to make sliding wing window and door frames which are very satisfactory from the operating standpoint, since it will provide a good thermal cut, without reducing the mechanical strength of the frame.

The invention as disclosed is susceptible to several variations and modifications, all of which will come within the scope of the inventive idea.

Moreover, all of the details can be replaced by other technically equivalent elements.

In practicing the invention, the used material, as well as the contingent size and shapes, can be any, according to requirements.

## Claims

1. A thermal-cut section member assembly, for making slidable wing window and door frames, characterized in that said assembly comprises fixed frame section members, including a bottom rail and top rail, connected by shoulder section members and having a central body adjoining, on its two sides, side bodies connected to said central bodies by means of spacer rods, made of a thermally insulating material, there being moreover provided sliding wing section members provided with box-like regions housing therein con-

necting brackets, to the wing section members forming the central uprights there being coupled finishing section members, connected through the interposition of a latching section member made of a thermally insulating material.

2. A section member assembly, according to Claim 1, characterized in that the bottom rail section members have a central body connected to an outer side body and an inner side body through a pair of spacer rods made of a thermally insulating material.
3. A section member assembly, according to Claims 1 and 2, characterized in that said assembly comprises, on the rail section members, latching seats provided on the side opposite to that having the sliding guide of the movable wings, for the connection to the fixed structure.
4. A section member assembly, according to one or more of the preceding claims, characterized in that the sliding guides or tracks of the movable wings are made of plastic material interchangeable section members.
5. A section member assembly, according to one or more of the preceding claims, characterized in that the shoulder section members comprise a box-like elongated body connected to an inner body by means of said rods, on a face of said shoulder section members there being provided seats for connecting the spacer rods, and adjusting members for adjusting the position of the fixed structure, whereas on the opposite side there are provided fins which extend perpendicular with respect to the inner face of the section member.
6. A section member assembly, according to one or more of the preceding claims, characterized in that the section members for the sliding wings are provided with a box-like central body having a seat for engaging therein a glass restraining section member, from said central body there extending an inner leg delimiting a box-like seat, whereas the outer leg is connected by means of polyamide spacer rods and being provided with box-like seats for engaging and fixing therein said connecting brackets.
7. A section member assembly, according to one or more of the preceding claims, characterized in that said finishing section members have a L shape, with an arm engaged between the outer leg and inner leg of the movable wing section members, and the other arm engaged between the two movable-wing frames and provided with

- a hollow for the connection of a polyamide locking section member.
- erating handle engaging with locking means connected to the shoulder section members.
8. A section member assembly, according to one or more of the preceding claims, characterized in that said locking section member is provided with a covering leg, including a seat in which there is engaged a compression seal which operates in compression against the edge of the leg covering the facing wing. 5
9. A section member assembly, according to one or more of the preceding claims, characterized in that said covering section members provide, in their connected condition, a double seal, consisting of the gaskets and an air sealing inner chamber. 10 15
10. A section member assembly, according to one or more of the preceding claims, characterized in that said assembly further comprises a fixed frame section member provided for making frame tops, said section member including a box-like body comprising locking seats for the connection to the fixed structure, and an inner abutment leg for the abutment against the swinging wing frame or against a fixed glass plate of the frame top. 20 25
11. A section member assembly, according to one or more of the preceding claims, characterized in that said assembly further comprises an inner body, connected to said box-like body by means of said thermally insulating material rods. 30 35
12. A section member assembly, according to one or more of the preceding claims, characterized in that said assembly further comprises a fix-frame horizontal section member for making a frame top, said horizontal section member including a sloping central body, provided with an inner abutment leg and coupling seats, on the opposite face thereof, for the connection of the top guide rail of the sliding wing, by means of fixing screws and a covering section member, operating as a closure member on the end faces. 40 45
13. A section member assembly, according to one or more of the preceding claims, characterized in that said assembly further comprises guide pads, associated with the sliding wing section members and suitable to operate, as the wing is caused to slide, as a guide element against projections provided on the top rail section member. 50 55
14. A section member assembly according to one or more of the preceding claims, characterized in that said assembly further comprises a closure lock of the "raise and slide" type, including an op-

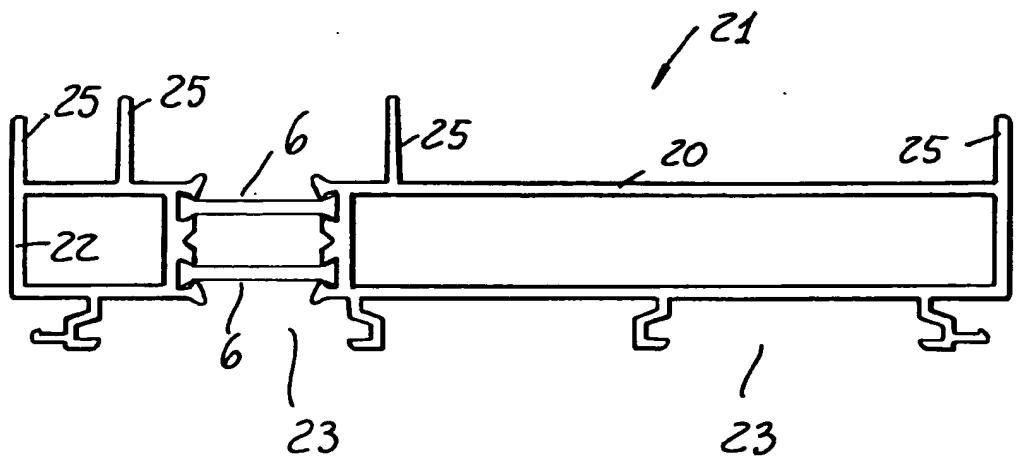


FIG. 4

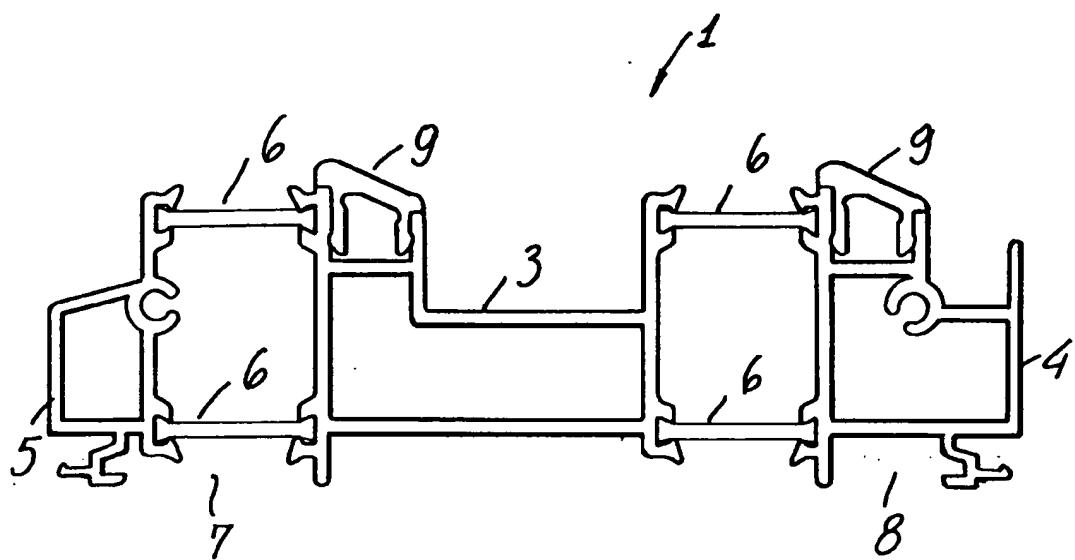


FIG. 1

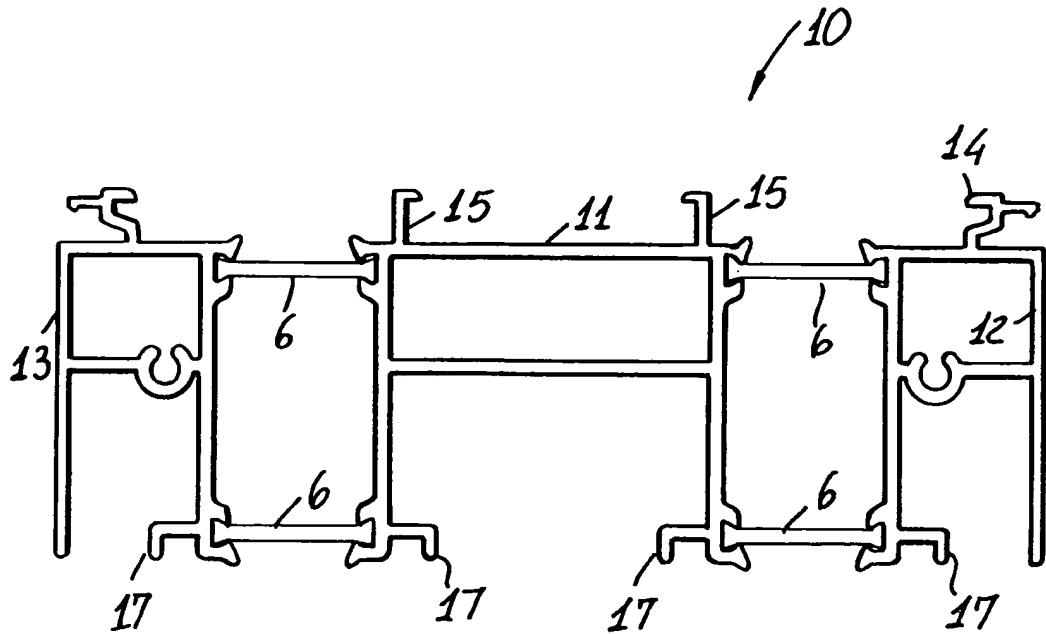


FIG. 3

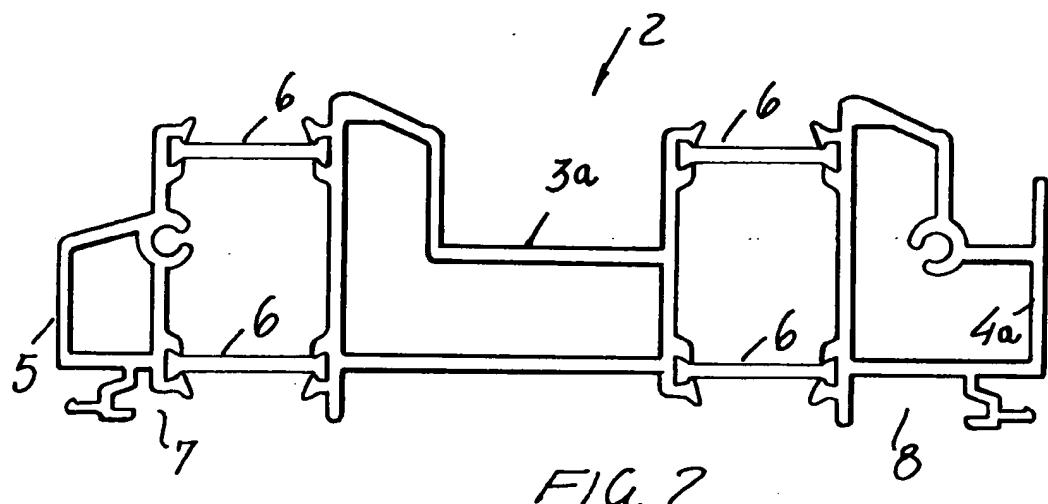


FIG. 2

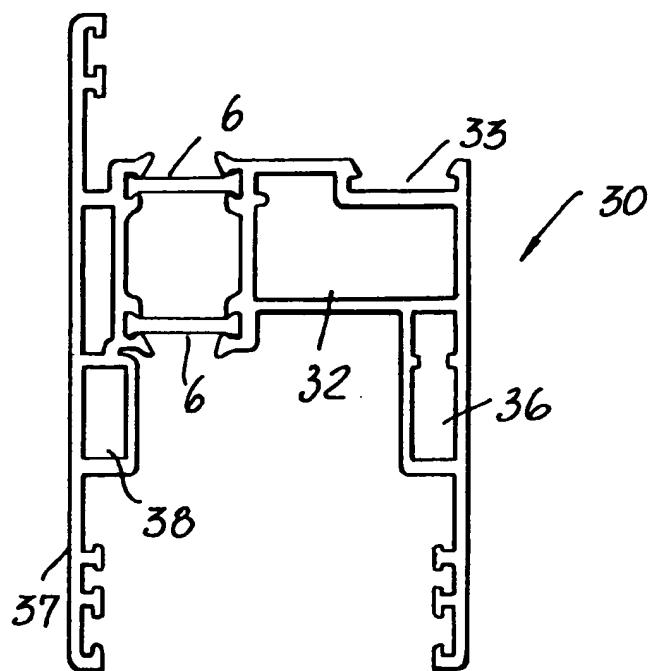


FIG. 5

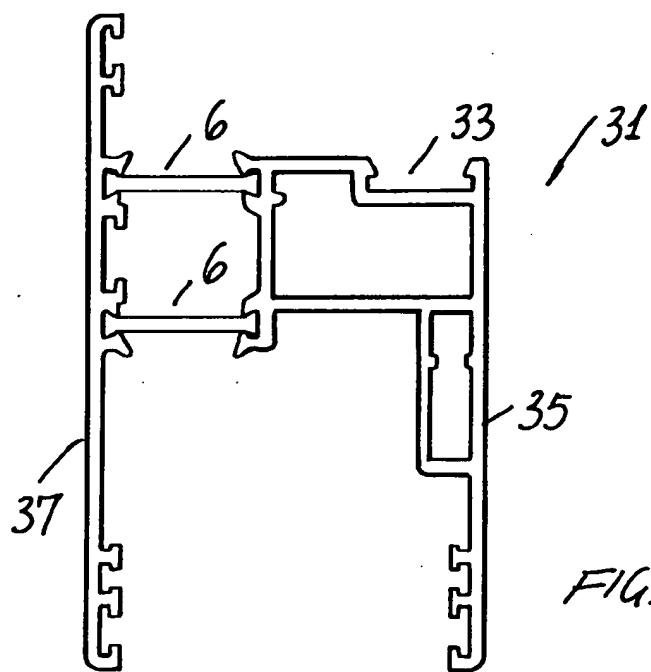


FIG. 6

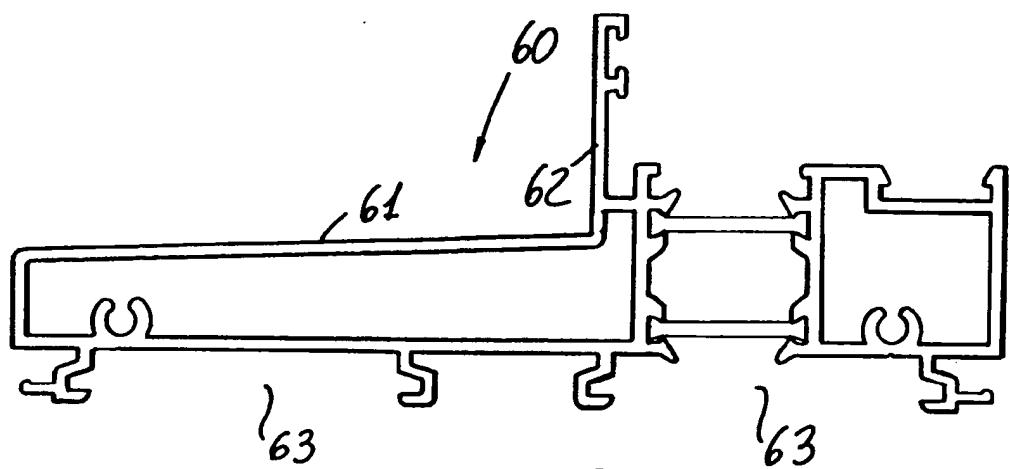


FIG. 9

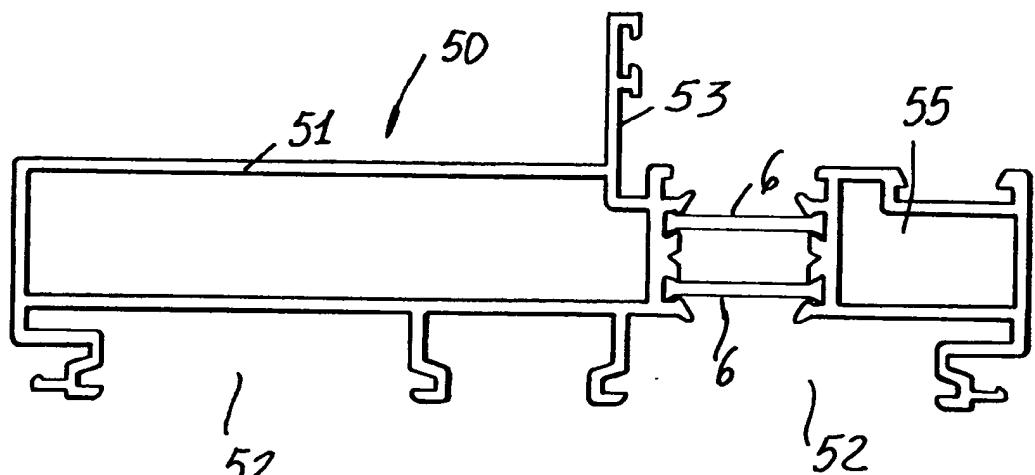


FIG. 8

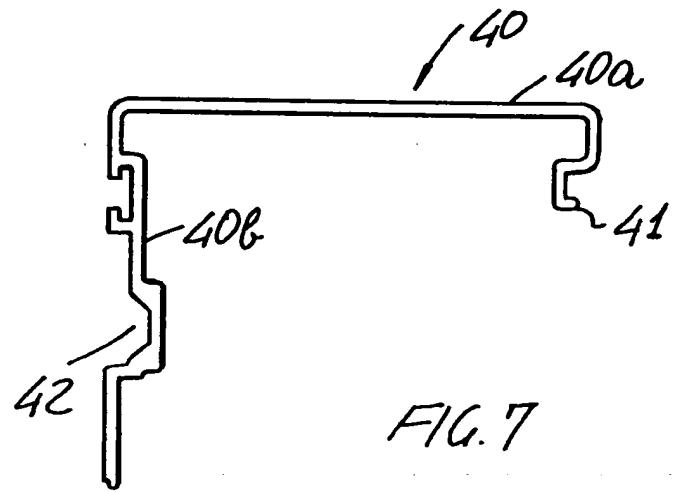


FIG. 7

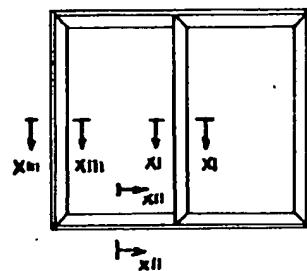


FIG. 10

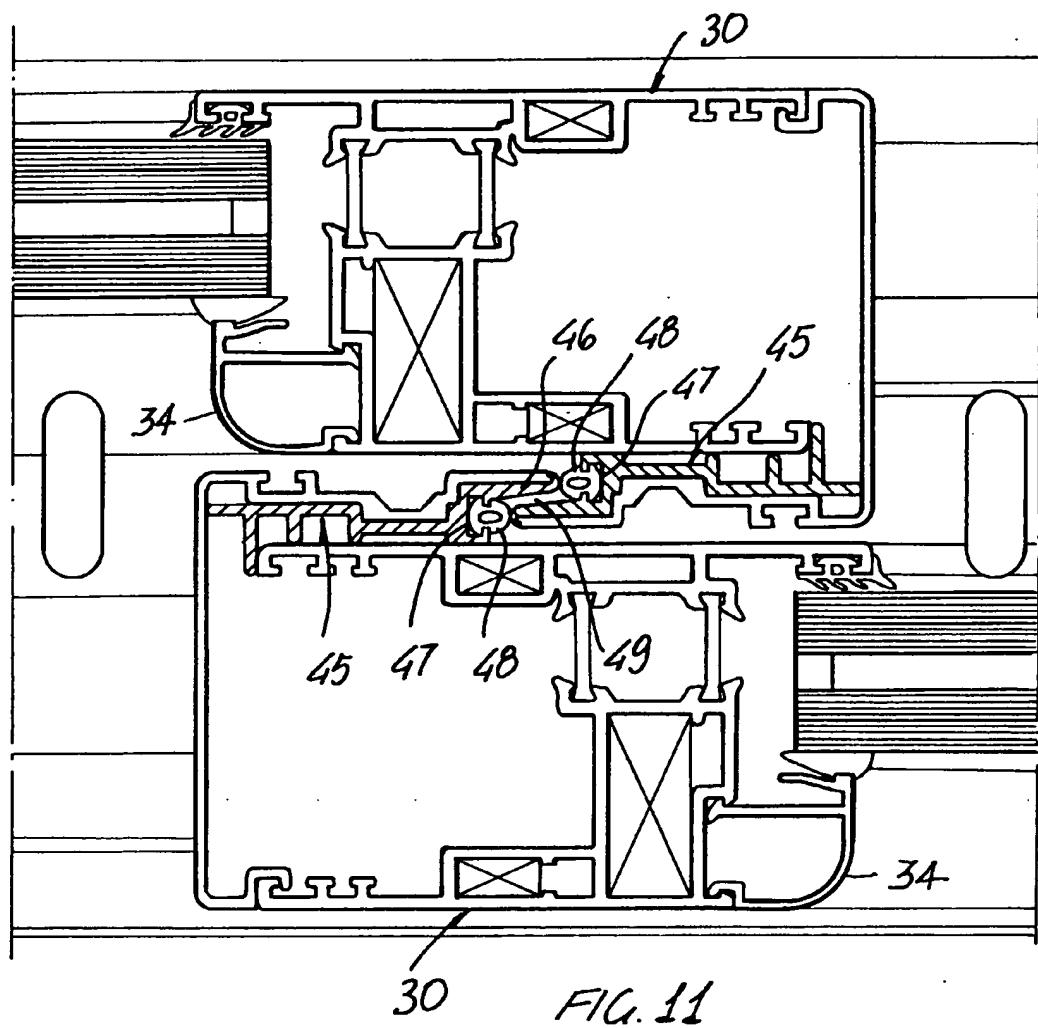


FIG. 11

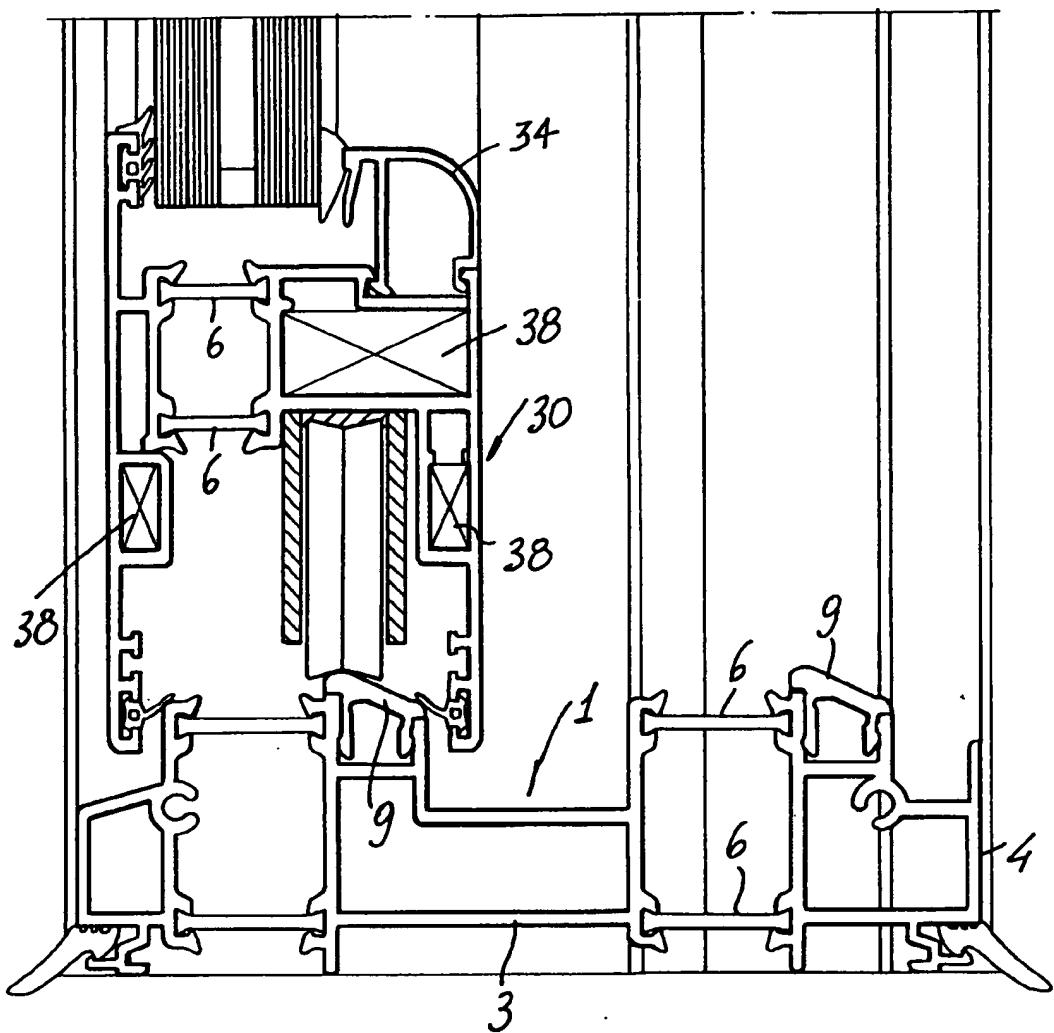


FIG. 12

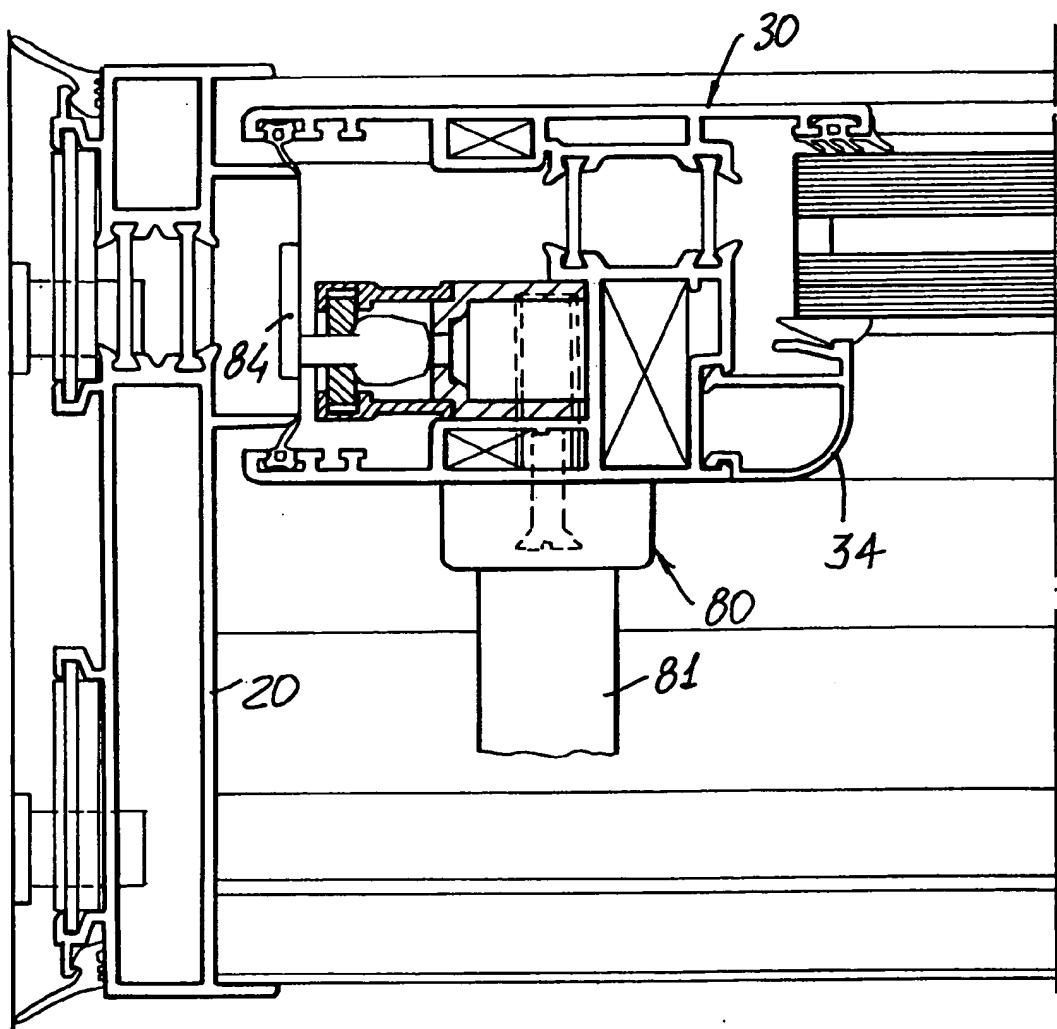


FIG. 13

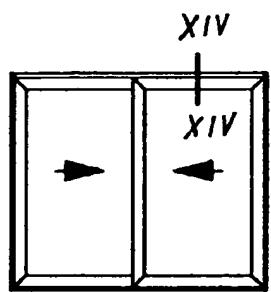


FIG. 14'

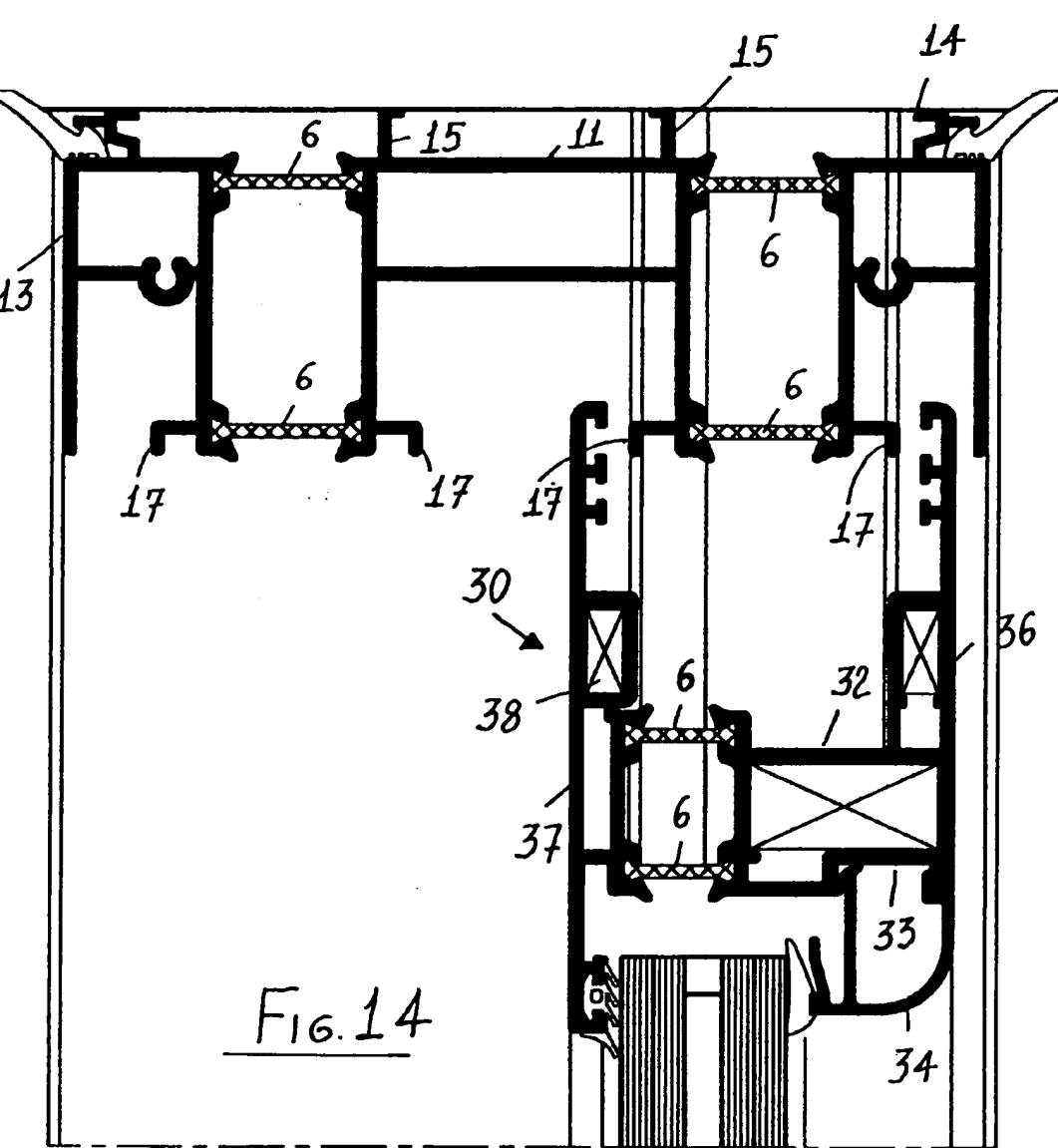


FIG. 14

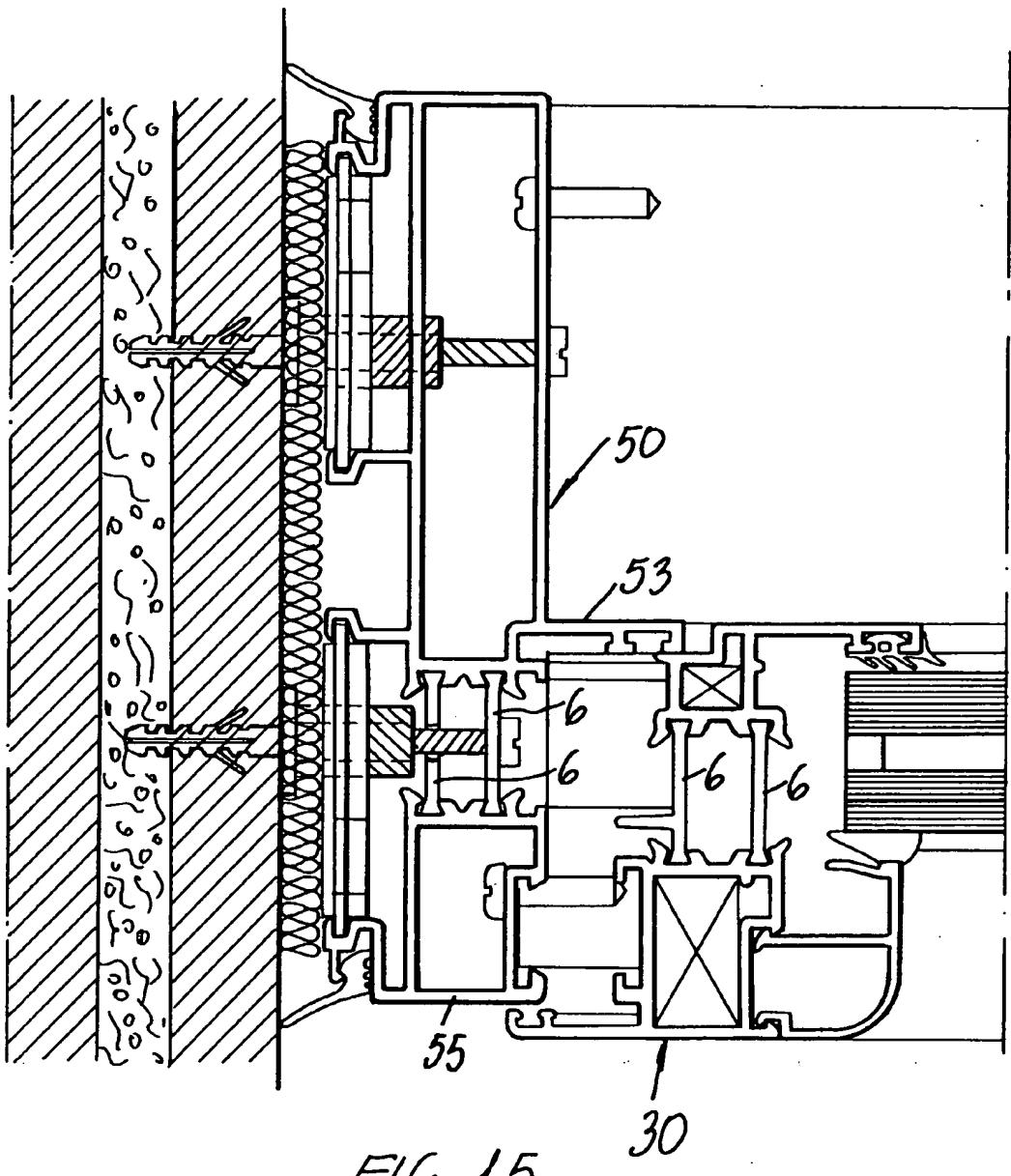


FIG. 15

